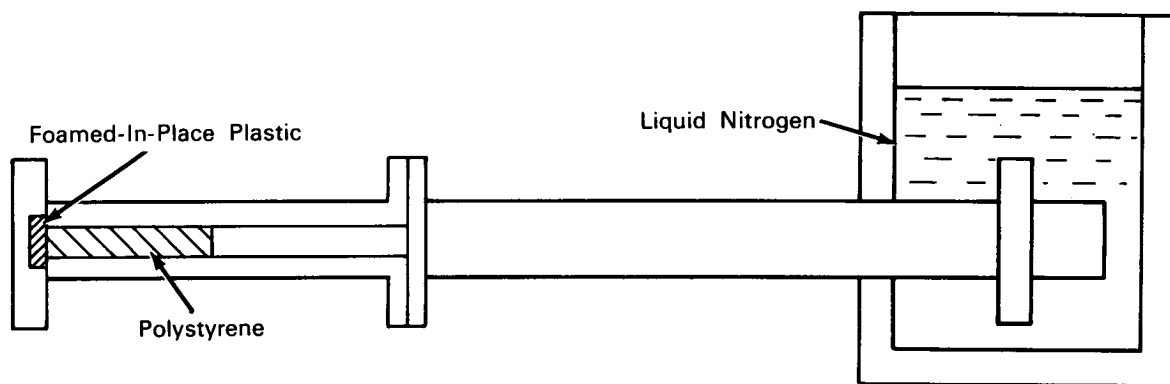


NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the NASA space program.

Cryogenic Waveguide Window Is Sealed With Plastic Foam



The problem: Microwave waveguide windows normally consist of thin dielectric membranes inserted between waveguide flanges. In microwave applications requiring the use of a cryogenically cooled waveguide, these windows receive condensation from the atmosphere and require special venting and sealing techniques.

The solution: Waveguide windows made from foam plastic sealed with foamed-in-place plastic.

How it's done: A 1- to 2-inch section of the waveguide is filled with polystyrene preformed plastic. A 1/16-inch coating of a foaming plastic mixture is applied to the outside end as a seal. As an example of the efficiency of this method, a 2-inch length of 511U brass waveguide (0.0119-db insertion loss—open), when filled with polystyrene plastic and sealed with foamed-in-place plastic, has an insertion loss of 0.020-db.

Notes:

1. This method would be useful in any microwave waveguide system using cryogenic cooling, such as a radar system employing low-noise input receivers.
2. Fabrication of this window requires no special tools and can be readily accomplished by electronic technicians.
3. For further information about this innovation inquiries may be directed to:

Technology Utilization Officer
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Pasadena, California 91103
Reference: B63-10613

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Charles T. Stelzried and Robert Clauss
(JPL-559)